

Rodent Poison Types Summary **NEVER USE THESE POISONS**

I. Anticoagulants

There are two categories of anticoagulants. LOOK AT THE PRODUCT LABEL to determine the type of poison.

A. **Second generation.** Products that have any of the following active ingredients are in this category:

Brodifacoum

Bromadiolone

Difethialone

Difenacoum

These are the most advanced, and dangerous, poisons. They are banned for consumer use in the United States, but are VERY commonly used by the professional pest control companies.

B. **First generation.** Most common active ingredients are

Diphacinone

Chlorophacinone

Warfarin

These are less potent, BUT – **1st Generation Anticoagulant Rodenticides are not the solution!** 2nd generation anticoagulants get most of the bad publicity, but recent research suggests that 1st generation anticoagulants are no better.

Here is a handout we made summarizing the evidence concerning the far more abundant 1st generation anticoagulants.

HELP GET RID OF ALL ANTICOAGULANT RODENT POISONS

- Anticoagulant rodent poisons have been sickening and killing **80-90%** of local wildlife – bobcats, foxes, coyotes, owls, hawks, mountain lions, etc.¹
- **1st gen anticoagulants**, namely diphacinone and chlorophacinone, are **UNRESTRICTED** and are all over the stores.
- **1st generation** anticoagulants poisoned P-22.²
- **1st generation diphacinone** was in **77%** of poisoned blood-tested bobcats in a 5-county southern California study by UCLA and NPS scientists.³
- See PoisonFreeMalibu.org for more information.

HELP SAVE ME FROM DIPHACINONE!



P-22, Heroic Griffith Park Mountain Lion
Featured in National Geographic.
Poisoned by Diphacinone

PLEASE CHECK STORES FOR "DIPHACINONE"-BASED
POISON AND ASK FOR IT TO BE REMOVED!

¹www.cdpr.ca.gov/docs/registration/reevaluation/chemicals/brodifacoum_final_assess.pdf

²www.nps.gov/samo/parknews/gp-lion-exposed-to-poison.htm

³www.urbanecarnivores.com/laurels-blog

II. Non-Anticoagulant Rodent Poisons

Ingredients: Bromethalin, Cholecalciferol (Vitamin D3), Strychnine, Zinc Phosphide, Aluminum Phosphide/Fumitoxin

A. Bromethalin

From EPA document <https://poisonfreemalibu.files.wordpress.com/2017/12/epa-hq-opp-2011-0718-0086.pdf>.

"Bromethalin is a neurotoxin. Clinically, this results in swelling of the brain (cerebral edema). In general, severe bromethalin poisonings are very concerning for clinicians because of less human experience with them and, unlike the anticoagulant rodenticides, **there is no specific diagnostic test or antidote**. Given that bromethalin targets the central nervous system, there is concern that the developing brain of young children may be particularly susceptible to the effects of bromethalin."

<https://healthypets.mercola.com/sites/healthypets/archive/2015/01/07/bromethalin-rat-poison.aspx>:

"Since 2011, the national Pet Poison Helpline has reported a 65 percent increase in bromethalin poisoning in pets."

"Bromethalin is a fast-acting neurotoxin that affects the brain and liver. In pets, signs of brain swelling and central nervous system disturbance appear within 2 to 24 hours of ingestion."

[National Park Service news - Mountain lion mom, P-67](#)

P-67 was found dead with anticoagulants and **non-anticoagulant bromethalin**.

She was a mother taking care of two kittens, P-91 and P-92, who were rescued by the National Park Service.

See <https://www.nps.gov/samo/learn/news/biologists-attempt-to-foster-orphaned-mountain-lion-kittens.htm>

Here is a quote from the news bulletin -

"She was also exposed to five different anticoagulant rodenticide compounds and to bromethalin, not an anticoagulant but a highly potent rodenticide that provides a lethal dose to rodents in a single feeding."

Rodenticides do not always kill directly. They can weaken the animal to the extent that they cannot do what's necessary to survive, like hunting.

The notable point here is the presence of bromethalin. It is NOT an anticoagulant rodent poison.

It is sometimes claimed that non-anticoagulants do not spread up the food chain to higher predators. This P-67 incident is a counter-example - mountain lions obviously do not eat rodent poisons of any kind directly. The bromethalin must have come up the food chain from rodents, raccoons, or another intermediate species.

A recent 2019 paper from the University of Georgia, *Evidence of bromethalin toxicosis in feral San Francisco "Telegraph Hill" conures*, notes

an increase in Bromethalin usage, and recommends more research to determine the sources and pathways that it follows to the poisoned animals. Quote:

"Reports of animal and human exposure to bromethalin increased following 2008 EPA mandates designed to decrease the use of SGARs like brodifacoum and bromadiolone, which are known to cause unintended secondary toxicosis in wildlife. The Pet Poison Helpline saw a 65% increase in bromethalin toxicosis cases reported between 2011 and 2014. The American Society for the Prevention of Cruelty to Animals said it received 2791 calls regarding exposure to bromethalin-based poisonings in 2015"



July 2020. Another Tragedy. Mom P-67 and Kittens P-91 and 92. P-67 was found dead and the kittens were orphaned.

www.nps.gov/samo/learn/news/biologists-attempt-to-foster-orphaned-mountain-lion-kittens.htm:

"She was also exposed to five different anticoagulant rodenticide compounds and to **bromethalin**, not an anticoagulant but a highly potent rodenticide that provides a lethal dose to rodents in a single feeding."



B. Cholecalciferol (Vitamin D3)

Here are two links to the facts about cholecalciferol.

1. <http://www.petpoisonhelpline.com/poison/cholecalciferol/>

Poisonous to: Cats, Dogs

Level of toxicity: Generally moderate to severe

"This is one of the most dangerous mouse and rat poisons on the market and unfortunately, seems to be gaining in popularity.

Cholecalciferol, or activated vitamin D3, causes a life-threateningly high calcium and phosphorus level in the body, resulting in severe, acute kidney failure."

"Unfortunately, cholecalciferol mouse and rat poison **does not have an antidote**, and is one of the most challenging poisoning cases to treat as hospitalization"

2. <https://www.drugs.com/answers/cholecalciferol-is-main-ingredient-in-rat-poison-336757.html>

"However, in practice it has been found that use of cholecalciferol in rodenticides represents a significant hazard to other animals, such as dogs and cats."

"Cholecalciferol produces hypercalcemia, which results in systemic calcification of soft tissue, leading to renal failure, cardiac abnormalities, hypertension, and Central nervous system depression.

3. From Melissa Booker, Navy Wildlife Biologist. Recent research shows that **rodents can play a role in spreading cholecalciferol**. This occurs not from secondary poisoning from eating the rodents, but from rats gathering cholecalciferol pellets away from bait stations and bringing it to their lairs. Foxes can then gain access to the pellets, eat them, and become fatalities.

C. Strychnine

Strychnine is an example of a very dangerous and previously unpopular poison making a comeback. Stella McMillin, California Department of Fish and Wildlife Environmental Scientist for Toxicology finds (<https://calwil.wordpress.com/2012/10/03/some-perspective-on-rodenticides>) –

"One rodenticide I'm keeping my eye on is strychnine. In California, we went nearly a decade without any reported cases of wildlife poisoned by strychnine. Now, in the last couple of years, we've had several. So, what's going on? Is it just coincidence or is it due to the increased regulation of anticoagulant rodenticides?"

From the California Department of Pesticide Regulation website on strychnine:

The California Department of Fish and Wildlife has the same concern – *“CDFW has also seen an increase in the number of strychnine-related wildlife losses in recent years,”* - www.wildlife.ca.gov/living-with-wildlife/rodenticides.

Two articles on strychnine from the California Department of Fish & Wildlife:

1) “Be Careful with Our Feathered Friends” - <https://calwil.wordpress.com/2012/07/06/be-careful-with-our-feathered-friends/>

2) “Some Perspectives on Rodenticides” - <https://calwil.wordpress.com/2012/10/03/some-perspective-on-rodenticides/>

Quote: “One rodenticide I’m keeping my eye on is strychnine. In California, we went nearly a decade without any reported cases of wildlife poisoned by strychnine. Now, in the last couple of years, we’ve had several. So, what’s going on? Is it just coincidence or is it due to the increased regulation of anticoagulant rodenticides?”

This poison has been historically almost abandoned due to its extreme danger. Strychnine has **NO antidote** and acts very quickly. Thus, it is especially dangerous. From a State of Michigan pesticide website - (https://www.michigan.gov/dnr/0,4570,7-350-79136_79608_85016-26326--,00.html), *“Due to the rapid absorption and action of strychnine, treatment is impractical for wildlife, unless found immediately after ingestion.”*

D. Zinc Phosphide

The rodenticide zinc phosphide is commonly used for poisoning ground squirrels and gophers. Zinc phosphide is in the most dangerous category of poison in that it cannot be purchased at a store and requires a license for application. It is true that it is not as susceptible to secondary poisoning as the anticoagulants, however, it is perhaps the most dangerous in regard to **primary** poisoning!

One of the most comprehensive and authoritative documents on wildlife poisoning is from an Environmental Protection Agency report from



**Products Currently Registered by DPR:
Strychnine bait**

[Back to School IPM Home](#)

Products on this list are not necessarily legal or appropriate for use in schools. **Always read and follow label restrictions and instructions.** This list does not constitute a recommendation from DPR or UCIPM.

- > **Click on each product name for a full product information report.**
- > **Click [here](#)** to view specific search criteria used to generate this page

Total Products Found - 1		
Product Name	EPA Signal Word	Restricted Status
WILCO GOPHER GETTER TYPE-1 BAIT	POISON/DANGER	

2004 entitled *Potential Risks of Nine Rodenticides to Birds and Nontarget Mammals: A Comparative Approach*. It can be found at <http://www.pesticideresearch.com/site/docs/bulletins/EPAComparisonRodenticideRisks.pdf>

Please see page 66 which states -

“Based on the comparative analysis model, zinc phosphide is ranked as the rodenticide posing the **greatest potential primary risk to nontarget mammals**, with brodifacoum ranked a distant second, and warfarin and bromadiolone an even more distant third and fourth.” These other three are the anticoagulants. Zinc phosphide is considered significantly **more dangerous for direct poisoning** of wildlife, pets, and children than the anticoagulant poisons.

This is especially startling considering the many users of parks and also wildlife. Here is a quote from the National Pesticide Information Center, co-sponsored by the Environmental Protection Agency and Oregon State

University, on their website <http://npic.orst.edu/factsheets/znpngen.html>.

“Young children and pets are most likely to be exposed to zinc phosphide by eating the bait pellets if they find them. Baits often have peanut butter, molasses, or other flavors that may attract dogs or children.” It continues, stating – “Zinc phosphide is very toxic to birds, fish, and other wildlife if it is eaten. Pellets or grain containing zinc phosphide may attract birds in particular. All baits should be placed so they are out of reach of any pets, children, or non-target wildlife.”

Another EPA document (<https://archive.epa.gov/pesticides/reregistration/web/pdf/0026red.pdf>) states “The Agency has also determined that a **single swallow** of zinc phosphide bait may be **fatal to a young child.**”!!

Birds appear to be the most vulnerable animal to zinc phosphide. The US Dept. of Agriculture reports (<http://extoxnet.orst.edu/pips/zincphos.htm>):

“Effects on birds: Zinc phosphide is highly toxic to wild birds. The most sensitive birds are geese. Pheasants, mourning doves, quail, mallard ducks, and the horned lark are also very susceptible to this compound. Blackbirds are less sensitive (U.S. National Library of Medicine. Hazardous Substances Databank. Bethesda, MD, 1995.10-9).”

The Michigan Department of Natural Resources website states (https://www.michigan.gov/dnr/0,4570,7-350-79136_79608_85016-26326--,00.html) -

“All species of animals are subject to zinc phosphide poisoning, but avian species, specifically gallinaceous birds {pheasants, turkeys, grouse, chicken}, are the most seriously affected. In Michigan, wild turkeys, ring-necked pheasants, black and gray squirrels, Canada geese, and possibly white-tailed deer have died from zinc phosphide poisoning.”

Finally, the above 2004 EPA report on page 107 concludes “Based on the lines-of-evidence assessment, potential **primary risks to birds are highest for zinc phosphide**, brodifacoum, and difethialone. A small bird finding and **eating a pellet or two** of any of these baits is likely to ingest a lethal dose, and **just a few pellets** could provide a lethal dose

to larger birds."

E. Aluminum Phosphide/Fumitoxin

Parks and recreation areas are where people, especially children and pets, are in close contact with the earth, with picnicking and ball playing in grassy areas. It is imperative that we look to non-poisonous ways of controlling pests. We are in particular concerned with the inclusion of *Fumitoxin* as an option for rodent control.

The EPA has placed *Fumitoxin* in its highest toxicity category, "Category 1 Danger." "Danger" means that the pesticide product is highly toxic if eaten, absorbed through the skin, or inhaled. If this is the case, the word "POISON" must also be included in red letters on the front panel of the pesticide product label.

The compound converts to a deadly phosphine gas when it comes in contact with moisture, eventually degrading into inorganic phosphate. This is a groundwater contaminant and contributes to ocean water quality degradation. The U.S. Department of Agriculture reported about *Fumitoxin* in 1997 that "burrowing fumigants will kill animals residing in treated burrows, so it is important to verify that burrows are occupied by target animals. Animals potentially affected by primary poisoning include nontarget rodents, burrowing owls, reptiles and amphibians, rabbits, raccoons, fox, weasel and skunk."

Fumitoxin caused the death of a four-year-old girl and her 15-month-old sister in 2010 in Utah. It leaked into the basement of their home after being used to treat the family's lawn for gophers. San Diego TV station CBS-8 reported on this story and implications locally. See below for more on this story.

More recently, January 2017, it happened again in Amarillo, Texas. Four children died and five additional family members sent to the hospital from a product containing the same phosphine gas compound - <http://www.cnn.com/2017/01/03/health/texas-pesticide-deaths>.

City of San Diego

The City of San Diego, Parks and Recreation Department had been relying on *Fumitoxin*. but determined that it will control rodents with safer methods. San Diego TV station CBS-8 reported on this in a November 2012 story.

Please watch the video and read the story here:

<http://www.cbs8.com/story/20114334/pesticide-that-killed-two-girls-used-at-san-diego-county-schools>

Quoting:

"The City of San Diego, Parks and Recreation Department stopped using *Fumitoxin* in 2010. Maintenance manager David Long said he used to use it for gopher control in Balboa Park. Now he uses traps.

"(Traps) are safe. They're underground. People aren't going to get into them. You know when you've killed the gopher because you have a body," said Long. Long said he changed to the non-toxic alternative out of concern for public safety. **"We use traps now and it's fairly effective," said Long. "Even when we used *Fumitoxin*, we still had gophers. But I don't believe our problem without *Fumitoxin* is any worse than it was with *Fumitoxin*."**

To learn more about San Diego's practices, Citywide District Manager Dave Long can be contacted at 619-235-1165.